AMENDMENTS TO THE CLAIMS

WE CLAIM:

Claim 1 (original) A variable inlet guide vane actuation system, comprising:

a control circuit adapted to receive one or more guide vane position command signals and operable, in response thereto, to supply guide vane actuation control signals;

a primary electric motor coupled to receive the guide vane actuation command signals and operable, in response thereto, to supply a drive force;

a plurality of drive mechanisms each coupled to receive the drive force; and

a plurality of actuator assemblies, each actuator assembly coupled to at least one of the drive mechanisms and configured, upon receipt of the drive force, to selectively move between a closed position and an open position.

Claim 2 (original) The system of Claim 1, further comprising:

a secondary electric motor coupled to receive the guide vane actuation control signals and operable, in response thereto, to supply a drive force.

Claim 3 (original) The system of Claim 2, wherein the control circuit includes at least a primary channel and a secondary channel, each control circuit channel adapted to receive the guide vane position control signals and operable, in response thereto, to supply guide vane actuation control signals.

Claim 4 (original) The system of Claim 3, wherein:

the primary electric motor is coupled to the control circuit primary channel; and

the secondary electric motor is coupled to the control circuit secondary channel.

Claim 5 (original) The system of Claim 3, wherein the primary and secondary motors are each coupled to both the control circuit primary and secondary channels.

Claim 6 (original) The system of Claim 3, wherein the control circuit is configured such that when the primary channel is active the secondary channel is inactive, and vice-versa.

Claim 7 (original) The system of Claim 2, further comprising:
a differential gear assembly coupled between the primary and secondary electric motors.

Claim 8 (original) The system of Claim 1, wherein the drive mechanisms each comprise a flexible shaft.

Claim 9 (original) The system of Claim 1, wherein each actuator is adapted to couple to a gas turbine engine unison ring.

Claim 10 (original) The system of Claim 1, further comprising:
a plurality of actuator position sensors, each actuator position sensor coupled to an actuator assembly and configured to supply position signals representative of actuator assembly position.

Claim 11 (original) The system of Claim 1, further comprising:
a brake coupled to the primary electric motor and configured to selectively (i) engage the primary electric motor, whereby the primary electric motor is prevented from supplying the drive force and (ii) disengage the primary electric motor, whereby the primary electric motor is allowed to supply the drive force.

Claim 12 (original) The system of Claim 11, wherein:
the brake is adapted to receive brake control signals and is operable, in response thereto, to selectively engage and disengage the primary electric motor.

Claim 13 (original) The system of Claim 11, wherein the brake is configured to engage the primary electric motor at least when the brake assembly is de-energized.

Claim 14 (original) The system of Claim 1, further comprising:

a rotational position sensor coupled to the primary electric motor and configured to supply one or more signals representative of a rotational position of the primary electric motor.

Claim 15 (original) The system of Claim 14, wherein the control circuit is (i) coupled to receive the rotational position signals from the rotational position sensor and (ii) configured to supply the guide vane actuation control signals based at least in part on the rotational position signals.

Claim 16 (original) The system of Claim 1, wherein the primary electric motor is a brushless DC motor.

Claim 17 (original) The system of Claim 1, wherein the primary electric motor is an AC induction motor.

Claim 18 (original) A variable inlet guide vane actuation system, comprising:

a control circuit including a primary channel and a secondary channel, each channel adapted to receive one or more guide vane position control signals and operable, in response thereto, to selectively supply guide vane actuation control signals;

a primary electric motor coupled to receive the guide vane actuation control signals from the primary channel and operable, in response thereto, to supply a drive force;

a secondary electric motor coupled to receive the guide vane actuation control signals from the secondary channel and operable, in response thereto, to supply a drive force; and

an actuator assembly coupled to the primary and secondary electric motors and configured, upon receipt of the drive force therefrom, to selectively move between a closed position and an open position.

Claim 19 (original) The system of Claim 1, wherein the control circuit is configured such that when the primary channel is active the secondary channel is inactive, and vice-versa.

Claim 20 (original) The system of Claim 2, the actuator assembly comprises:

a differential gear assembly coupled between the primary and secondary electric motors.

Claim 21 (original) The system of Claim 1, wherein each actuator is adapted to couple to a gas turbine engine unison ring.

Claim 22 (original) The system of Claim 1, further comprising:

an actuator position sensor coupled to the actuator assembly and configured to supply position signals representative of actuator assembly position.

Claim 23 (original) The system of Claim 1, further comprising:

a primary brake assembly coupled to the primary electric motor and configured to selectively (i) engage the primary electric motor, whereby the primary electric motor is prevented from supplying the drive force and (ii) disengage the primary electric motor, whereby the primary electric motor is allowed to supply the drive force; and

a secondary brake assembly coupled to the secondary electric motor and configured to selectively (i) engage the secondary electric motor, whereby the secondary electric motor is prevented from supplying the drive force and (ii) disengage the secondary electric motor, whereby the secondary electric motor is allowed to supply the drive force.

Claim 24 (original) The system of Claim 10, wherein:

the primary and secondary channels are further operable, in response to the guide vane position control signals, to selectively supply primary and secondary brake control signals, respectively; and

the primary and secondary brake assemblies are coupled to receive the primary and secondary brake control signals, respectively, and are respectively operable, in response thereto, to selectively engage and disengage, respectively, the primary and secondary electric motors.

Claim 25 (original) The system of Claim 11, wherein the primary and secondary brake assemblies are configured to engage the primary and secondary electric motor, respectively, at least when the brake assembly is de-energized.

Claim 26 (original) The system of Claim 1, further comprising:

a primary rotational position sensor coupled to the primary electric motor and configured to supply one or more signals representative of a rotational position of the primary electric motor; and

a secondary rotational position sensor coupled to the secondary electric motor and configured to supply one or more signals representative of a rotational position of the secondary electric motor.

Claim 27 (original) The system of Claim 13, wherein:

the primary channel (i) is coupled to receive the primary motor rotational position signals from the primary rotational position sensor and (ii) is configured to supply the guide vane actuation control signals based at least in part on the primary motor rotational position signals; and

the secondary channel (i) is coupled to receive the secondary motor rotational position signals from the secondary rotational position sensor and (ii) is configured to supply the guide vane actuation control signals based at least in part on the secondary motor rotational position signals

Claim 28 (original) The system of Claim 1, wherein the primary and secondary electric motors are each brushless DC motors.

Claim 29 (original) The system of Claim 1, wherein the primary and secondary electric motors are each AC induction motors.

Claim 30 (original) A variable inlet guide vane actuation system, comprising:

a control circuit including a primary channel and a secondary channel, each channel including a first motor controller and a second motor controller, each motor controller in each channel adapted to receive one or more guide vane position control signals and operable, in response thereto, to supply guide vane actuation control signals;

a first primary electric motor coupled to receive the guide vane actuation control signals from the primary channel first motor controller and operable, in response thereto, to supply a drive force;

a second primary electric motor coupled to receive the guide vane actuation control signals from the primary channel second motor controller and operable, in response thereto, to supply a drive force;

a first secondary electric motor coupled to receive the guide vane actuation control signals from the secondary channel first motor controller and operable, in response thereto, to supply a drive force;

a second secondary electric motor coupled to receive the guide vane actuation control signals from the secondary channel second motor controller and operable, in response thereto, to supply a drive force;

a first actuator assembly coupled to the first primary and first secondary electric motors and configured, upon receipt of the drive force therefrom, to selectively moe between a closed position and an open position; and

a second actuator assembly coupled to the second primary and second secondary electric motors and configured, upon receipt of the drive force therefrom, to selectively move between a closed position and an open position,

wherein the control circuit is configured such that when the primary channel is active the secondary channel is inactive, and vice-versa.

Claim 31 (original) The system of Claim 1, wherein the control circuit is configured such that when the primary channel is active the secondary channel is inactive, and vice-versa.

Claim 32 (original) The system of Claim 2, the actuator assembly comprises:

a differential gear assembly coupled between the primary and secondary electric motors.

Claim 33 (original) The system of Claim 1, wherein each actuator is adapted to couple to a gas turbine engine unison ring.

Claim 34 (original) The system of Claim 1, further comprising:

an actuator position sensor coupled to the actuator assembly and configured to supply position signals representative of actuator assembly position.

Claim 35 (original) The system of Claim 1, further comprising:

a primary brake assembly coupled to the primary electric motor and configured to selectively (i) engage the primary electric motor, whereby the primary electric motor is prevented from supplying the drive force and (ii) disengage the primary electric motor, whereby the primary electric motor is allowed to supply the drive force; and

a secondary brake assembly coupled to the secondary electric motor and configured to selectively (i) engage the secondary electric motor, whereby the secondary electric motor is prevented from supplying the drive force and (ii) disengage the secondary electric motor, whereby the secondary electric motor is allowed to supply the drive force.

Claim 36 (original) The system of Claim 10, wherein:

the primary and secondary channels are further operable, in response to the guide vane position control signals, to selectively supply primary and secondary brake control signals, respectively; and

the primary and secondary brake assemblies are coupled to receive the primary and secondary brake control signals, respectively, and are respectively operable, in response thereto, to selectively engage and disengage, respectively, the primary and secondary electric motors.

Claim 37 (original) The system of Claim 11, wherein the primary and secondary brake assemblies are configured to engage the primary and secondary electric motor, respectively, at least when the brake assembly is de-energized.

Claim 38 (original) The system of Claim 1, further comprising:

a primary rotational position sensor coupled to the primary electric motor and configured to supply one or more signals representative of a rotational position of the primary electric motor; and

a secondary rotational position sensor coupled to the secondary electric motor and configured to supply one or more signals representative of a rotational position of the secondary electric motor.

Claim 39 (original) The system of Claim 13, wherein:

the primary channel (i) is coupled to receive the primary motor rotational position signals from the primary rotational position sensor and (ii) is configured to supply the guide vane actuation control signals based at least in part on the primary motor rotational position signals; and

the secondary channel (i) is coupled to receive the secondary motor rotational position signals from the secondary rotational position sensor and (ii) is configured to supply the guide vane actuation control signals based at least in part on the secondary motor rotational position signals

Claim 40 (original) The system of Claim 1, wherein the primary and secondary electric motors are each brushless DC motors.

Claim 41 (original) The system of Claim 1, wherein the primary and secondary electric motors are each AC induction motors.

Claim 42 (original) A gas turbine engine system, comprising:

an engine case;

a turbine mounted at least partially within the engine case and having a plurality of moveable inlet guide vanes;

a unison ring rotationally coupled between the engine case and each of the inlet guide vanes; and

a guide vane actuation control system, including:

a control circuit adapted to receive one or more guide vane position control signals and operable, in response thereto, to supply guide vane actuation control signals,

a primary electric motor coupled to receive the guide vane actuation control signals and operable, in response thereto, to supply a drive force;

a plurality of drive mechanisms each coupled to receive the drive force; and

a plurality of actuator assemblies, each actuator assembly coupled between at least one of the drive mechanisms and the unison ring and configured, upon receipt of the drive force therefrom, to selectively rotate the unison ring in either a first or a second direction, to thereby selectively move the inlet guide vanes between a closed position and an open position, respectively.

Claim 43 (original) A gas turbine engine system, comprising:

an engine case;

a turbine mounted at least partially within the engine case and having a plurality of moveable inlet guide vanes;

a hardened unison ring rotationally coupled between the engine case and each of the inlet guide vanes; and

a guide vane actuation control system including:

a control circuit including a primary channel and a secondary channel, each channel adapted to receive one or more guide vane position control signals and operable, in response thereto, to supply guide vane actuation control signals,

a primary electric motor coupled to receive the guide vane actuation control signals from the primary channel and operable, in response thereto, to supply a drive force,

a secondary electric motor coupled to receive the guide vane actuation control signals from the secondary channel and operable, in response thereto, to supply a drive force, and

an actuator assembly coupled between the primary and secondary electric motors and the unison ring, the actuator assembly configured, upon receipt of the drive force therefrom, to selectively rotate the unison ring in either a first or a second direction, to thereby selectively move the inlet guide vanes between a closed position and an open position, respectively.

Claim 44 (original) A gas turbine engine system, comprising:

an engine case;

a turbine mounted at least partially within the engine case and having a plurality of moveable inlet guide vanes;

a unison ring rotationally coupled between the engine case and each of the inlet guide vanes; and

a guide vane actuation control system, including:

a control circuit including a primary channel and a secondary channel, each channel including a first motor controller and a second motor controller, each motor controller in each channel adapted to receive one or more guide vane position control signals and operable, in response thereto, to supply guide vane actuation control signals;

a first primary electric motor coupled to receive the guide vane actuation control signals from the primary channel first motor controller and operable, in response thereto, to supply a drive force;

a second primary electric motor coupled to receive the guide vane actuation control signals from the primary channel second motor controller and operable, in response thereto, to supply a drive force;

a first secondary electric motor coupled to receive the guide vane actuation control signals from the secondary channel first motor controller and operable, in response thereto, to supply a drive force;

a second secondary electric motor coupled to receive the guide vane actuation control signals from the secondary channel second motor controller and operable, in response thereto, to supply a drive force;

a first actuator assembly coupled to the first primary and first secondary electric motors and configured, upon receipt of the drive force therefrom, to selectively moe between a closed position and an open position; and

a second actuator assembly coupled to the second primary and second secondary electric motors and configured, upon receipt of the drive force therefrom, to selectively move between a closed position and an open position,

wherein the control circuit is configured such that when the primary channel is active the secondary channel is inactive, and vice-versa.

Claim 45 (cancelled)